

Marine SI Sales and Price Estimates

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I. Summary

The purpose of this analysis is to provide inputs to our benefit-cost analysis for potential emissions standards for spark-ignition (SI) marine engines and vessels. These inputs include engine sales, vessel sales, and retail price values organized by engine size and application. This information is derived from three primary source types: 1) Environmental Protection Agency and California Air Resources Board marine engine certification databases, 2) statistical data published by the National Marine Manufacturers Association, 3) advertised prices in the trade literature and on the web.

Tables I-1 and I-2 below, summarize the results of this analysis. The remainder of this document is divided into three sections: 1) personal watercraft (PWC), 2) sterndrive and inboard (SD/I) engines/vessels, and 3) outboard (OB) marine engines/vessels. For SD/I and OB engines, we divide the applications into “recreational” and “luxury” categories to distinguish typical vessels from the very expensive vessels where the engine is only a small part of the vessel cost. In addition, we have a category for OB called loose engines, which is described later in this document.

Table I-1: 2003 Sales of SI Marine Vessels by Application and Engine Rating

Vessel	<25 hp	25-50 hp	50-100 hp	100-175 hp	175-300 hp	300 hp +
PWC	–	–	20,507	56,383	3,710	–
SD/I rec.	–	–	–	14,839	34,361	25,253
SD/I lux.	–	–	–	–	7,514	8,411
OB rec.	30,352	41,641	60,248	35,219	32,515	–
OB lux.	–	–	–	3,562	3,562	–
OB loose	32,169	–	–	–	–	–

Table I-2: 2003 Retail Price for SI Marine Vessels By Application and Engine Rating*

Vessel	<25 hp	25-50 hp	50-100 hp	100-175 hp	175-300 hp	300 hp +
PWC	–	–	\$7,111	\$9,382	\$11,241	–
SD/I rec.	–	–	–	\$15,554	\$30,410	\$43,639
SD/I lux.	–	–	–	–	\$54,534	\$193,288
OB rec.	\$3,614	\$10,608	\$20,867	\$31,369	\$47,687	–
OB lux.	–	–	–	\$62,780	\$100,590	–
OB loose	\$2,392	–	–	–	–	–

* includes the cost of replacement engines for recreational and luxury OB vessels (3% discount rate)

II. Personal Watercraft

Personal watercraft (PWC) is the generic name for vessels commonly referred to as “Jet-skis” or “Wave-runners” which are actually trade-names for specific products. For the purpose of this analysis, we define PWCs as vessels less than 13 feet in length, using a jet engine, where operators ride on, rather than in, the vessel. This is consistent with the International Standards Organization definition of PWC. Jet boats are therefore not included in this part of the analysis. Instead, they are included in the SD/I analysis later in this document.

PWC vessels are each propelled by a single engine with a jet drive. Information on this vessel type is fairly complete for three reasons. First, there are only a handful of PWC manufacturers, second, nearly every PWC manufacturer lists retail prices on their web sites, and third, sales projections for each engine family are included in the EPA certification database. Sales projections for each of the manufacturers are not explicitly presented in this document because they are confidential business information. However, Table II-1 presents total sales and average price information published by the National Marine Manufacturers Association (NMMA).¹

Table II-1: NMMA Retail Summary for PWC 2000-2003

	2000	2001	2002	2003
Total Population	1,239,400	1,293,900	1,353,700	1,420,000
Total Sales	92,000	80,900	79,300	80,600
Retail Value	\$720,176,000	\$658,107,000	\$697,681,000	\$716,502,000
Average Price	\$7,828	\$8,135	\$8,798	\$8,890

The goal of this analysis is to determine PWC sales and average prices for three power categories which are intended to represent typical PWC applications. These power categories are 50-100 hp, 100-175 hp, and >175 hp which represent entry level, higher end, and performance applications respectively. We use sales projections contained in the 2004 EPA certification database for spark-ignition marine engines² to allocate PWC sales to these power categories. The pricing data (and sources for this data) that we collected are attached in Appendix A. We use the sales projections in the EPA certification database to determine weighted average prices for each power category. This results in an average weighted average price of \$8,751 which is 1.6% lower than the NMMA estimate for 2003. We therefore apply a single adjustment factor of about 1.016 to the estimated average prices for each power category to force the weighted average price to match the NMMA estimate. Table II-2 presents the 2003 sales and price estimates by power category.

¹ NMMA Facts and Figures, <http://www.nmma.org/facts/>.

² www.epa.gov/otaq/certdata.htm

Table II-2: PWC Retail Estimates by Category for 2003

	50 - 99.9 hp	100-174.9 hp	175 hp +	total
Sales Fraction	0.254	0.700	0.046	1.000
Total Sales	20,507	56,383	3,710	80,600
Unadjusted Retail Value	\$141,821,000	\$514,472,000	\$40,554,000	\$696,847,000
Average Price	\$6,916	\$9,125	\$10,932	\$8,751
Adjusted Retail Value	\$145,821,000	\$528,983,000	\$41,698,000	\$716,502,000
Average Price	\$7,111	\$9,382	\$11,241	\$8,890

III. Sterndrive/Inboard

Sterndrive and inboard engines are those that are directly mounted in the vessel. Sterndrive engines are typically mounted in the rear of the vessel with a drive system passing through the hull of the vessel. Inboards may be located in the center or back of the vessel and are connected to the propeller with a shaft that passes through the vessel hull. Sterndrive and inboard (SD/I) marine engines are typically derived from automotive engine blocks. For the purpose of this analysis, jet boats are treated as sterndrives and air boats are treated as inboards.

Table III-1 presents sales information made available by NMMA³ on the sales of SD/I engines and vessels. This information is divided into four primary boat types and includes both gasoline and diesel engine fractions. Air boats did not appear to be included in this data set.

Table III-1: NMMA 2003 Retail Summary for SD/I Vessels (gasoline and diesel)

	IB ski/wake	IB cruisers	Sterndrives	Jet Boats
Total Sales	11,000	9,300	69,200	5,600
Retail Value	\$403,290,000	\$3,467,323,000	\$2,221,117,000	\$115,268,000
Average Price	\$36,332	\$372,830	\$32,097	\$20,584
Gasoline Fraction	100%	43%	99%	100%
Gasoline Boat Sales	11,100	3,971	68,508	5,600
Gas Engines/Boat*	1.00	1.92	1.05	1.05**

* based on 2002 population data

** not reported for jet boats, so same value is used as for sterndrives

³ NMMA Facts and Figures, <http://www.nmma.org/facts/>.

A. SD/I Sales

Sterndrive and inboard engines are those that have an engine packaged inside the vessel with the drive system exterior to the hull. The difference between a sterndrive and an inboard is that the sterndrive engine is located in the back of the vessel and has an attached lower drive unit that passes through the hull. In contrast, inboard engines may be located in the rear or middle of the boat and are connected to the propeller by a propeller shaft that passes through the hull. For the most part, SD/I engines come in a limited number of engine sizes that are based on automotive engine blocks supplied to the marine industry.

To determine sales fractions of SD/I engines by size, we use sales projections provided by the California Air Resources Board based on their SD/I certification data. This data set includes both California-only and National sales projections. Six manufacturers have certified in California which we believe represent more than 90% of the total SD/I engine sales in the U.S. Estimates for the remainder of sales, including high performance engines and air boats, are based on conversations with manufacturers of these products.

We also need to split the engine sales between sterndrives and inboards so that the sales fractions can be used in conjunction with the NMMA data. This split between sterndrive and inboard engines largely can be determined from the certification data. However, in cases where engines are certified for use as either a sterndrive or an inboard application, we make judgements based on our understanding of the industry and on vessel product information presented in Appendix B2. Table III-2 presents the SD/I engine sales fractions by rated power.

Table III-2: SD/I Engine Sales Fractions by Rated Power for 2003

	100-174.9 hp	175-299.9 hp	300 hp +	Total
Sales Fraction	0.152	0.455	0.393	1.000
Engine Sales	14,804	44,490	38,427	97,722
Typical Displacement	3.0 L	4.3, 5.0 L	5.7 - 8.2 L	--
Sterndrive Fraction	100%	90%	60%	79%
Inboard Fraction	0%	10%	40%	21%

We use NMMA data on sterndrive boat types to determine the sales fractions of recreational versus luxury vessel sales. We classify seven of the twelve boat types as recreational applications, and the rest, we classify as luxury applications. For this analysis we estimate that recreational applications have only one engine per boat while large cruisers and performance boats would have two engines per vessel. For the remaining vessels, we solved for the number of engines per vessel that would be necessary to achieve the average of 1.05 engines/vessel estimated by NMMA. Table III-3 presents the results of these estimates.

Table III-3: 2002 Sterndrive Sales Fractions by Type of Craft

Type of Boat	Sales Fraction	Application	Engines/Boat	Engine Fraction
Center Console	0.8%	recreational	1.00	0.8%
Express Cruiser	12.6%	luxury	1.13	13.6%
Fish-N-Ski	2.0%	recreational	1.00	1.9%
Flybridge Sedan	0.1%	luxury	2.00	0.2%
Deck Boat	7.0%	recreational	1.00	6.7%
Pontoon Boat	1.2%	recreational	1.00	1.1%
Express Fish Boat	0.1%	luxury	1.13	0.1%
Other Fish Boat	0.3%	recreational	1.00	0.3%
Performance Boat	2.4%	luxury	2.00	4.6%
Runabout Bowrider	65.2%	recreational	1.00	62.1%
Runabout Cuddy	6.6%	luxury	1.13	7.1%
Walkaround	1.7%	recreational	1.00	1.6%
Subtotal rec.	78.2%	recreational	1.00	74.5%
Subtotal lux.	21.8%	luxury	1.20	25.5%

We consider any sterndrive vessel with an engine rated less than 175 hp to be a recreational vessel due to the relatively low cost of these vessels. For engines over 175 hp used in sterndrive vessels (excluding jet boats), we apply a distribution of 74.5% recreational and 25.5% luxury to the engine sales based on the figures presented in Table III-3 above. Jet boats are classified as recreational sterndrives for this analysis.

For vessels using inboard marine engines, we classify the ski/wake boats and air boats as recreational vessels. No inboards less than 175 hp were identified. For cruisers, we distinguished between vessels greater than and less than 25 feet in length to classify recreational versus luxury vessels. According to the NMMA data, cruisers less than 25 feet in length made up about 4% of the 2002 cruiser sales. Assuming that all of these smaller cruisers use gasoline engines, we can estimate the recreational cruiser sales by multiplying the total inboard cruisers sales (gasoline and diesel powered) by 0.04. The remaining gasoline cruisers are considered to be luxury vessels. Tables III-4 and III-5 present the sales estimates for SD/I engines and vessels.

Table III-4: SD/I Engine Sales by Category and Rated Power for 2003

	100-174.9 hp	175-299.9 hp	300 hp +	Total
Sterndrive Engine Sales	14,839	39,991	22,984	77,813
Recreational	14,839	31,284	17,117	63,241
Luxury	0	8,706	5,866	14,573
Inboard Engine Sales	0	4,552	15,357	19,909
Recreational	0	3,839	8,461	12,300
Luxury	0	713	6,896	7,609
Total SD/I Engine Sales	14,839	44,543	38,340	97,722
Recreational	14,839	35,123	25,578	75,541
Luxury	0	9,419	12,762	22,181

Table III-5: SD/I Vessel Sales by Category and Rated Power for 2003

	100-174.9 hp	175-299.9 hp	300 hp +	Total
Sterndrive Vessel Sales	14,839	37,664	21,605	74,108
Recreational	14,839	30,522	16,792	62,154
Luxury	0	7,142	4,812	11,954
Inboard Vessel Sales	0	4,211	12,060	16,271
Recreational	0	3,839	8,461	12,300
Luxury	0	372	3,599	3,971
Total SD/I Vessel Sales	14,839	41,875	33,665	90,379
Recreational	14,839	34,361	25,253	74,454
Luxury	0	7,514	8,411	15,925

B. SD/I Pricing

Engine and vessel price data are available from a number of public sources including magazine articles and internet sites. The sources used in this analysis are listed in appendices B1 and B2. Appendix B1 includes a list of prices for Mercruiser and Volvo Penta sterndrive marine engines. These two manufacturers represent the majority of SD/I engine sales in the U.S. and both carry full product lines with a range of power and options. Appendix B2 lists advertized vessel prices for a wide range of SD/I vessels. This list comprises a total of 46 vessels from 20 manufacturers ranging from 18 to 46 feet in length. Although this is by no means a comprehensive list of the thousands of vessel models available for sale, it does provide a cross-section of typical boat prices.

To determine the vessel cost for each engine power category, the vessels in Appendix B2 are grouped into the power classes. For each of these power classes, the vessels are distinguished as either sterndrive or inboard and as either a recreational or a luxury vessel.

Average costs for sterndrive and inboard vessels in each category are sales weighted based on the estimates presented above in Table III-5. In cases where the average number of engines per boat in the price listings does not match the estimates used above, the total vessel prices are adjusted using the engine price data in Appendix B1. For instance if the weighted average number of engines is 1.6 in the vessel price data set, but estimated to be 1.5 on average for that power class, then the price is be adjusted downward by 10% ($1.6 - 1.5 = 0.1$) of the average engine price. Table III-6 presents these price estimates.

The weighted average NMMA estimate for inboards/skiboats, sterndrives, and jet boats, based on the figures in Table III-1, is about \$32,000, which should roughly represent the average cost of recreational vessels. The weighted average cost of recreational vessels from this analysis is about \$35,000 which is about 9% higher than the NMMA average. This difference could be due to the limited amount of pricing data collected, the weighting of this price data, or differences between advertised price and retail sale value. To correct for this difference, we adjust our price estimates for recreational vessels downward by 9%. Because the NMMA data does not split inboard cruisers pricing between gasoline and diesel powered vessels, it is more difficult to make any sort of comparison between the results of this analysis and the NMMA data. It is expected that the average cost of gasoline powered vessels may be significantly lower than the average cost of diesel powered vessels. This relationship was observed and deemed reasonable, therefore, no adjustment is made to the luxury vessel price estimates. Table III-6 also presents the adjusted price estimates.

Table III-6: SD/I Vessel Pricing by Category and Rated Power for 2003

	100-174.9 hp	175-299.9 hp	300 hp +	Wtd. Avg.
Recreational Vessel unadjusted	\$16,906	\$33,054	\$47,434	\$34,713
adjusted	\$15,554	\$30,410	\$43,639	\$31,936
Luxury Vessel	—	\$54,534	\$193,288	\$127,820

Table III-7 presents average engine prices in recreational and luxury vessels as well as average number of engines. Average engine prices are determined using the engine prices in Appendix B1 and vessel characteristics in Appendix B2. Average number of engines is determined by dividing the engine sales in Table III-4 by the vessel sales in Table III-5.

Table III-7: SD/I Engine Pricing by Category and Rated Power for 2003

	100-174.9 hp	175-299.9 hp	300 hp +	Wtd. Avg.
Recreational Vessel				
per engine price	\$7,274	\$11,838	\$17,739	\$12,940
engines per vessel	1.00	1.02	1.01	1.01
total engine(s) price	\$7,274	\$12,101	\$17,967	\$13,128
Luxury Vessel				
per engine price	—	\$12,643	\$20,222	\$17,004
engines per vessel	—	1.25	1.52	1.39
total engine(s) price	—	\$15,849	\$30,682	\$23,683

IV. Outboards

Outboard engines have an engine and drive unit in a single package that is designed to be mounted externally on the rear of a vessel. These engines may be sold as part of a package with a vessel or sold individually. Table IV-1 presents the estimates developed by NMMA⁴ for outboard (OB) engine and vessel populations, sales, and retail values for 2001 through 2003.

Table IV-1: NMMA 2003 Retail Summary for OB Engines and Vessels

	2001	2002	2003
Engines Owned	8,759,400	8,976,500	—*
Engines Sold	299,100	302,100	305,400
Total Retail Value	\$2,411,045,100	\$2,479,938,900	\$2,554,533,570
Avg. Engine Price	\$8,061	\$8,209	\$8,365
OB Boats Owned	8,335,700	8,381,100	8,420,000
OB Boats Sold	217,800	212,000	207,100
Total Retail Value	\$2,195,859,600	\$2,280,908,000	\$2,742,825,960
Avg. Boat Price	\$10,082	\$10,759	\$13,244
Engines/Vessel Owned	1.05	1.07	—*
Engines/Vessel Sold	1.37	1.43	1.47
Avg. Engines + Boat	\$18,553	\$19,551	\$22,171

* not reported on NMMA website.

⁴ NMMA Facts and Figures, <http://www.nmma.org/facts/>.

A. Outboard Sales

In addition to reporting total sales estimates for outboard engines and vessels, the NMMA data presents a breakdown of OB engine sales for nine power classes. Table IV-2 presents the NMMA projected sales distribution for 2002. Because this is the most recent year available, we use this distribution for 2003 as well. The NMMA power categories do not line up exactly with the five power categories that we are using in this analysis. Therefore, EPA certification data is used, where necessary, to subdivide the NMMA power categories. (Because outboard engines must certify to existing emission standard, projected sales are contained in the EPA certification records for each engine manufacturer.) For instance, we split the NMMA 10-29.9 horsepower category into greater than and less than 25 horsepower so that sales could be determined for a 0-25 hp category. The sales by power category are presented in Table IV-2. Total sales are based on the NMMA estimate presented in Table IV-1.

Table IV-2: 2003 Outboard Engine Sales by Power Category

NMMA Category	Sales Fraction	EPA Category	Sales Fraction	Sales
0-3.9 hp	3.6%	0-24.9 hp	23.0%	70,109
4-9.9 hp	13.8%			
10-29.9 hp	13.5%			
30-49.9 hp	9.1%	25-49.9 hp	17.0%	52,052
50-74.9 hp	14.1%	50-99.9 hp	25.5%	77,876
75-99.9 hp	11.4%			
100-149.9 hp	13.8%	100-174.9 hp	17.8%	54,429
150-199.9 hp	7.7%	175 -299.9 hp	16.7%	50,934
200 hp +	13.0%			

We use NMMA data on outboard boat types to determine the sales fractions of recreational versus luxury vessel sales. We classify nine of the fourteen boat types as recreational applications, and four as luxury applications. We estimate that recreational applications have only one engine per boat while luxury boats have two engines per vessel. The one exception to this is for center console boats. Based on the data in Appendix C2, it is clear that there is a mix of recreational and luxury center console boats. Also many of the recreational (lower cost) versions of this vessel have two engines. To account for this, we solve for the recreational/luxury split and the number of boats per recreational center console vessel so that our analysis would match the NMMA estimates of total engine sales, boat sales, and engines per boat. Table IV-3 presents the results of these estimates.

Table IV-3: Estimated 2003 Recreational and Luxury Outboard Boat Sales

Type of Boat	Sales Fraction	Application	Boat Sales	Engines/Boat
Bass Boat	13.3%	recreational	27,544	1
Center Console	14.7%	recreational/luxury*	24,355	1.3
Express Cruiser	0.2%	luxury	414	2
Fish-N-Ski	6.3%	recreational	13,047	1
Deck Boat	2.9%	recreational	6,006	1
Pontoon Boat	18.6%	recreational	38,521	1
Express Fish Boat	0.0%	luxury	0	2
Other Fish Boat	18.9%	recreational	39,142	1
Performance Boat	0.1%	luxury	207	2
Runabout Bowrider	1.1%	recreational	2,278	1
Runabout Cuddy	0.2%	luxury	414	2
Tournament Ski	0.0%	recreational	0	1
Utility	19.7%	recreational	40,799	1
Walkaround	4.0%	recreational	8,284	1
Total Recreational	96.6%		199,796	1.03
Total Luxury	3.4%		7,124	2

* based on 95% recreational

For this analysis, we consider any outboard vessel with an engine rated less than 100 hp to be a recreational vessel due to the relatively low cost of these vessels. Lacking better information, we assume that half of the luxury vessels used engines between 100 and 175 hp and half used engine greater than 175 hp. This is consistent with the sales mix between these two power classes. Our estimate of the total number of luxury vessels is shown in Table IV-3 above.

As shown in Table IV-1 above, the ratio of engines/vessels sold is significantly higher than the ratio of engines/vessels owned. Often outboard engines are sold individually either as replacement engines or added to vessels that were either originally sold without engines (e.g. rowboats or sailboats) or were originally sold with a large engine and the owner desires a second (or third) smaller engine for lower speed operation (i.e. trolling). According to NMMA, the average life of an outboard vessel is 25 years while the average life of an outboard motor is 20 years.⁵ This suggests a replacement rate of 1.25 (25/20). Unlike for SD/I and PWC engines, OB engine replacements are simple and common because the engine can be replaced without having to cut-away part of the deck and/or hull. Small engines used to provide power for low speed on larger vessels are known as kickers. These kickers are common on fishing vessels or for vessels that operate often in no wake zones. An advantage of using smaller kicker engines is fuel conservation.

⁵ E-mail from James Petru, NMMA, to Mike Samulski, EPA, July 7, 2004 (see Appendix C3).

We account for the higher engine than vessel sales in three ways. First, we recognize that some vessels are sold with more than one engine. We use 1.07 engines per boat based on the 2002 NMMA ratio of engine population to boat population. Second, we adjust the number of engines per vessel using the replacement rate of 1.25 discussed above. Because these engines are necessary for the operation of the vessels, we believe it is appropriate to assign the replacement engines to boats rather than creating a separate class for replacement engines. Third, we create a separate class for kicker/add-on engines called loose engines. These engines are not necessary for the operation of the vessels and are therefore considered as separate entities. The ratio of loose engine sales to vessel sales can be determined by dividing the ratio of engine to boat sales for 2003 (Table IV-1) by the engines/boat and replacement ratios. Therefore, the loose engine ratio works out to be 1.11 ($1.47/[1.07*1.25]$). (As a check, there are a total of 32,169 loose engine sales which seems reasonable given that this represents about 0.27 loose engines for every fishing vessel sold.) Table IV-4 presents the sales estimates for outboard engines and vessels.

Table IV-4: OB Engine Sales by Category and Rated Power for 2003

	0-24.9 hp	25-49.9 hp	50-99.9 hp	100-174.9 hp	175-299.9 hp
OB Engine Sales	70,109	52,052	77,876	54,429	50,934
Recreational	37,940	52,052	77,876	45,524	42,029
Luxury	0	0	0	8,905	8,905
Loose	32,169	0	0	0	0
OB Vessel Sales	30,352	41,641	60,248	38,781	36,078
Recreational	30,352	41,641	60,248	35,219	32,515
Luxury	0	0	0	3,562	3,562

B. Outboard Pricing

Outboard engine and vessel price data are collected from a number of public sources including magazine articles and internet sites. These sources are listed in appendices C1 and C2. Appendix C1 includes a list of prices for each of the outboard engine manufactures that sell into the U.S. market. Appendix C2 lists advertized vessel prices for a wide range of OB vessels. This list comprises a total of 80 vessels from 23 boat manufacturers ranging from 8 to 38 feet in length. In some cases, the advertized prices are presented as either with an engine while in other cases the vessel price is presented without an engine. Therefore, the engine price data in Appendix C1 was used to determine price with and without an engine for each vessel. Although this is by no means a comprehensive list of the thousands of vessel models available for sale, it does provide a cross-section of typical boat prices.

To determine the vessel cost for each engine power category, the vessels in Appendix C2 are grouped into the power classes. For each of these power classes, the vessels are determined to be either a recreational or a luxury vessel. Average costs for each power class are calculated without any attempt to estimate sales weightings for the various boat samples. Because sales weightings are not available, vessels with very high costs (>\$100,000) were removed from the

set for averaging on the assumption that relative sales of these vessels are very small. Table IV-5 presents these price estimates. Note that these prices are for the vessels only and do not include the price of the engines.

The weighted average NMMA estimate for outboard boats based on the figures in Table IV-1, is \$13,244. The weighted average cost of outboard vessels from this analysis is \$13,968 which is about 5% higher than the NMMA average. This difference could be due to the limited amount of pricing data collected, using a straight average of this price data, or differences between advertised price and retail sale value. To correct for this difference, we adjust our price estimates for outboard vessels downward by 5%. Table IV-5 also presents the adjusted price estimates.

Table IV-5: OB Vessel Price Estimates (excluding engines) for 2003

	0-24.9 hp	25-49.9 hp	50-99.9 hp	100-174.9 hp	175-299.9 hp
Unadjusted					
Recreational	\$988	\$5,024	\$12,144	\$18,531	\$27,940
Luxury	—	—	—	\$38,199	\$63,068
Adjusted					
Recreational	\$936	\$4,764	\$11,515	\$17,571	\$26,492
Luxury	—	—	—	\$36,220	\$59,800

Table IV-6 presents average price estimates for outboard marine engines by power class. Average engine prices are determined using the engine prices in Appendix C1 weighted by projected engine sales in the EPA certification database. This results in a weighted average of \$7,889 per engine which is about 6% lower than the \$8,365 per engine estimated by NMMA (see Table IV-1). This difference is likely a result of the pricing information used. The data included in Appendix C1 is based on the least expensive model available for each of the engine types. Therefore it is reasonable that the EPA estimate would be somewhat lower than the retail based estimate made by NMMA. To account for this, we adjust the price estimates up by 6% for each of the power classes as shown in Table IV-6.

Table IV-6: OB Engine Price Estimates for 2003

	0-24.9 hp	25-49.9 hp	50-99.9 hp	100-174.9 hp	175-299.9 hp
Unadjusted	\$2,256	\$4,842	\$7,376	\$10,793	\$16,437
Adjusted	\$2,392	\$5,134	\$7,821	\$11,444	\$17,428

To determine total outboard vessel prices, we need to combine the vessel and engine prices shown in Tables IV-5 and IV-6. First, we must use the engine/boat ratios presented in Table IV-3 and per engine costs in Table IV-6 to compute the engine costs per boat. This represents the engine cost component of a vessel when it is purchased and does not consider the

cost of replacement engines. We also consider the cost of replacement engines for each boat sold at a replacement rate of 0.25 engines for each engine on a boat. The replacement engine costs are presented both with and without discounting (3% and 7%) using the useful life estimates in the NONROAD emission model. Table IV-7 presents the engine costs per vessel.

Table IV-7: OB Engine(s) per Vessel Total Price Estimates for 2003

	0-24.9 hp	25-49.9 hp	50-99.9 hp	100-174.9 hp	175-299.9 hp
New Engines/Boat					
Recreational	1.00	1.00	1.03	1.03	1.03
Luxury	—	—	—	2.00	2.00
New Engine \$/Boat					
Recreational	\$2,392	\$5,134	\$8,087	\$11,834	\$18,022
Luxury	—	—	—	\$22,888	\$34,856
Repl. Engines/Boat*					
Recreational	0.25	0.25	0.26	0.26	0.26
Luxury	—	—	—	0.50	0.50
Avg. Engine Life	25	20	17	15	13
Repl. Engine \$/Boat					
Recreational					
undiscounted	\$598	\$1,283	\$2,091	\$3,059	\$4,659
3% discount	\$286	\$711	\$1,265	\$1,964	\$3,173
7% discount	\$110	\$332	\$662	\$1,109	\$1,933
Luxury					
undiscounted	—	—	—	\$5,722	\$8,714
3% discount	—	—	—	\$3,673	\$5,934
7% discount	—	—	—	\$2,074	\$3,616

* replacement engines per boat = (replacement ratio-1) x engines per boat

Table IV-8 presents the total vessel price for each of the engine scenarios presented above in Table IV-7. For the purpose of this analysis, we include the cost of the replacement engines in the vessel cost and use a 3% discount rate. A 3% discount rate is considered to reflect the time value of money for a typical recreational boat owner. The cost of loose engines are not added into our vessel cost estimates because we consider these engine sales to be independent of boat sales for the purpose of this analysis.

Table IV-8: Total OB Engine and Vessel Price Estimates for 2003

	0-24.9 hp	25-49.9 hp	50-99.9 hp	100-174.9 hp	175-299.9 hp
No Repl. Engine Recreational Luxury	\$3,328 —	\$9,898 —	\$19,602 —	\$29,405 \$59,108	\$44,514 \$94,656
Undiscounted Recreational Luxury	\$3,926 —	\$11,181 —	\$21,693 —	\$32,464 \$64,830	\$49,173 \$103,370
3% Discount Recreational Luxury	\$3,614 —	\$10,608 —	\$20,867 —	\$31,369 \$62,780	\$47,687 \$100,590
7% Discount Recreational Luxury	\$3,438 —	\$10,229 —	\$20,264 —	\$30,514 \$61,182	\$46,448 \$98,272

APPENDIX A: PRICE DATA FOR PWC

Manufacturer	Boat	length ft	fuel capacity gallons	boat type	engine type	# of engines	engine description	price	cite
Yamaha	superjet (extreme sport)	7.4	4.8	stand-up	PWC	1	73 hp	\$ 6,399	4
Kawasaki	800-SX-R	7.5	4.8	stand-up	PWC	1	80 hp	\$ 5,999	2
Polaris	Octane	7.5	4.5	stand-up	PWC	1	100 hp	\$ 7,999	3
Bombardier	XP DI Sport	8.9	14.3	2 seater	PWC	1	130 hp	\$ 8,999	1
Kawasaki	Ultra 150	9.5	15.3	2 seater	PWC	1	145 hp	\$ 8,599	2
Kawasaki	Ultra 130 DI	9.5	15.3	2 seater	PWC	1	130 hp	\$ 7,999	2
Yamaha	GP 1300 R (Ult. Perform.)	9.6	15.9	2 seater	PWC	1	165 hp	\$ 8,999	4
Yamaha	GP800R (performance)	9.6	15.9	2 seater	PWC	1	120 hp	\$ 7,399	4
Honda	Aquatrax R12	10	16.0	2 seater	PWC	1	125 hp	\$ 8,999	5,6
Polaris	Virage i	10.0	17.8	3 seater	PWC	1	100 hp	\$ 7,999	3
Polaris	Virage	10.0	17.8	3 seater	PWC	1	95 hp	\$ 6,999	3
Polaris	Freedom	10.0	17.8	3 seater	PWC	1	95 hp	\$ 6,499	3
Bombardier	RXP Musclecraft	10.1	15.9	2 seater	PWC	1	215 hp	\$ 10,399	1
Bombardier	GTI Recreation	10.1	15.0	3 seater	PWC	1	85 hp	\$ 5,999	1
Bombardier	GTI RFI Recreation	10.1	15.0	3 seater	PWC	1	110 hp	\$ 6,999	1
Bombardier	GTI LE Recreation	10.1	15.0	3 seater	PWC	1	85 hp	\$ 6,899	1
Bombardier	GTI LE RFI Recreation	10.1	15.0	3 seater	PWC	1	110 hp	\$ 7,899	1
Kawasaki	STX-15F	10.2	16.4	3 seater	PWC	1	160 hp	\$ 9,799	2
Kawasaki	STX-12F	10.2	16.4	3 seater	PWC	1	125 hp	\$ 8,499	2
Kawasaki	900 STX	10.2	16.4	3 seater	PWC	1	100 hp	\$ 6,999	2
Kawasaki	1200-SX-R	10.2	16.4	3 seater	PWC	1	145 hp	\$ 8,999	2
Yamaha	XL 700 (sport value)	10.3	13.2	3 seater	PWC	1	80 hp	\$ 6,499	4
Yamaha	XLT 1200 (Ult. Perform.)	10.4	18.5	3 seater	PWC	1	155 hp	\$ 8,499	4
Yamaha	XL T800 (performance)	10.4	18.5	3 seater	PWC	1	120 hp	\$ 7,799	4
Honda	Aquatrax F-12X	10	16.0	3 seater	PWC	1	165 hp	\$ 9,999	5,7
Polaris	MSX 150	10.5	18.5	3 seater	PWC	1	150 hp	\$ 9,699	3
Polaris	MSX 140	10.5	17.8	3 seater	PWC	1	140 hp	\$ 9,099	3
Polaris	MSX 110	10.5	18.5	3 seater	PWC	1	110 hp	\$ 8,699	3
Bombardier	GTX 4-TEC Limited Luxury	10.9	15.9	3 seater	PWC	1	185 hp	\$ 11,999	1
Bombardier	GTX 4-TEC Musclecraft	10.9	15.9	3 seater	PWC	1	185 hp	\$ 10,399	1
Bombardier	GTX 4-TEC Luxury	10.9	15.9	3 seater	PWC	1	155 hp	\$ 9,599	1
Bombardier	GTX 4-TEC Wake. Rec.	10.9	15.9	3 seater	PWC	1	155 hp	\$ 10,199	1
Polaris	Genesis i	10.9	17.8	4 seater	PWC	1	135 hp	\$ 9,199	3

Yamaha	FX High Output (U.P.)	11.0	18.5	3 seater	PWC	1	160 hp	\$ 9,999	4
Yamaha	FX Cruiser High Output UP	11.0	18.5	3 seater	PWC	1	160 hp	\$ 10,199	4
Yamaha	FX-140 (performance)	11.0	18.5	3 seater	PWC	1	140 hp	\$ 9,299	4
Yamaha	FX Cruiser (performance)	11.0	18.5	3 seater	PWC	1	140 hp	\$ 9,499	4
Yamaha	SUV1200 (advent. touring)	12.6	18.5	4 seater	PWC	1	135 hp	\$ 9,499	4

CITES:

1. www.seadoo.com
2. www.kawasaki.com
3. www.yamaha-motor.com
4. www.polarisindustries.com
5. www.honda-marine.com
6. Trailer Boats Magazine, April 2004
7. Trailer Boats Magazine, June 2004

APPENDIX B1: PRICE DATA FOR SD/I ENGINES

Manufacturer	Displacement (L)	Rated Horsepower	Fuel System	Base Price	Cylinders
Mercury	3.0	135	carb	\$ 7,107	I4
Volvo Penta	3.0	135	carb	\$ 7,400	I4
Mercury	4.3	190	carb	\$ 9,800	V6
Volvo Penta	4.3	190	carb	\$ 10,145	V6
Mercury	4.3	190	carb	\$ 10,715	V6
Mercury	4.3	190	carb	\$ 10,715	V6
Volvo Penta	4.3	190	carb	\$ 11,170	V6
Mercury	4.3	220	MPI	\$ 11,544	V6
Volvo Penta	4.3	225	MPI	\$ 11,800	V6
Mercury	4.3	220	MPI	\$ 12,460	V6
Mercury	4.3	220	MPI	\$ 12,460	V6
Volvo Penta	4.3	225	MPI	\$ 12,830	V6
Volvo Penta	4.3	225	MPI	\$ 13,950	V6
Mercury	5.0	220	carb	\$ 10,841	V8
Volvo Penta	5.0	220	carb	\$ 11,120	V8
Mercury	5.0	220	carb	\$ 11,591	V8
Mercury	5.0	220	carb	\$ 11,756	V8
Mercury	5.0	220	carb	\$ 11,756	V8
Volvo Penta	5.0	220	carb	\$ 12,150	V8
Mercury	5.0	260	MPI	\$ 12,973	V8
Volvo Penta	5.0	270	MPI	\$ 13,220	V8
Mercury	5.0	260	MPI	\$ 13,688	V8
Mercury	5.0	260	MPI	\$ 13,852	V8
Mercury	5.0	260	MPI	\$ 13,852	V8
Volvo Penta	5.0	270	MPI	\$ 14,250	V8
Volvo Penta	5.0	270	MPI	\$ 15,520	V8
Mercury	5.7	250	carb	\$ 12,819	V8
Volvo Penta	5.7	260	carb	\$ 13,230	V8
Mercury	5.7	250	carb	\$ 13,570	V8
Mercury	5.7	250	carb	\$ 13,734	V8
Mercury	5.7	250	carb	\$ 13,734	V8
Volvo Penta	5.7	260	carb	\$ 14,260	V8
Mercury	5.7	300	MPI	\$ 14,532	V8
Volvo Penta	5.7	280	MPI	\$ 14,555	V8
Mercury	5.7	300	MPI	\$ 15,283	V8
Mercury	5.7	300	MPI	\$ 15,477	V8
Mercury	5.7	300	MPI	\$ 15,477	V8
Volvo Penta	5.7	280	MPI	\$ 15,585	V8
Volvo Penta	5.7	280	MPI	\$ 16,795	V8
Volvo Penta	5.7	320	MPI	\$ 16,900	V8
Mercury	5.7	300	MPI	\$ 16,918	V8
Mercury	5.7	300	MPI	\$ 17,082	V8
Mercury	5.7	300	MPI	\$ 17,082	V8
Volvo Penta	5.7	320	MPI	\$ 17,930	V8
Volvo Penta	5.7	320	MPI	\$ 19,320	V8
Mercury	6.2	320	MPI	\$ 17,997	V8
Mercury	6.2	320	MPI	\$ 18,161	V8
Mercury	6.2	320	MPI	\$ 18,585	V8
Mercury	6.2	320	MPI	\$ 19,624	V8
Mercury	6.2	320	MPI	\$ 19,788	V8

Mercruiser	6.2	320	MPI	\$ 20,171	V8
Volvo Penta	8.1	375	MPI	\$ 20,995	V8
Mercruiser	8.1	375	MPI	\$ 21,204	V8
Mercruiser	8.1	375	MPI	\$ 21,368	V8
Mercruiser	8.1	375	MPI	\$ 21,751	V8
Volvo Penta	8.1	420	MPI	\$ 25,120	V8
Mercruiser	8.1	425	MPI	\$ 26,679	V8
Mercruiser	8.1	425	MPI	\$ 26,843	V8
Mercruiser	8.1	425	MPI	\$ 27,226	V8
Mercruiser	8.1	425	MPI	\$ 30,097	V8

Source: Trailer Boats Magazine, January 2004, "Marine Power, 2004."

APPENDIX B2: PRICE DATA FOR SD/I VESSELS

Manufacturer	Boat	length ft	gallons fuel capacity	boat type	engine type	# of engines	engine description	price	cite
Bayliner	175 runabout	17.5	21	runabout	SD	1	3.0 L merc	\$ 9,995	1
Bayliner	185 runabout	18.2	28	runabout	SD	1	3.0 L merc	\$ 11,995	1
Bayliner	195 classic runabout	18.8	23	runabout	SD	1	3.0 L merc	\$ 14,995	1
Cobalt	240 sundeck	24	50	runabout bowrider	SD	1	4.3L volvo	\$ 53,795	6
Correct Craft	nautique SV-211	23	38	runabout bowrider	IB	1	5.7L PCM	\$ 43,294	3
Correct Craft	nautique SV-211	23	38	runabout ski	IB	1	5.7L PCM	\$ 54,361	3
Correct Craft	Sport Natique 216	24	30	runabout	SD	1	5.7L PCM 330hp	\$ 41,000	2
Correct Craft	Sport Natique 216	24	30	runabout	SD	1	5.7L PCM 370hp	\$ 52,627	2
Crownline	250CR	25	75	runabout cuddy	SD	1	5.0L merc	\$ 63,525	1
Crownline	250CR	25	75	runabout cuddy	SD	1	5.7L volvo	\$ 68,317	1
Four Winns	horizon 250	26	75	runabout bowrider	SD	1	5.7L merc	\$ 53,023	4
Four Winns	horizon 250	26	75	runabout bowrider	SD	1	5.7L volvo	\$ 53,285	4
Glastron	MX 175	18		runabout bowrider	SD	1	3.0L volvo	\$ 10,988	1
Glastron	SX 195	19	31	runabout bowrider	SD	1	3.0L volvo	\$ 17,344	4
Glastron	SX 195	19	31	runabout bowrider	SD	1	5.0L volvo	\$ 23,178	4
Hunt	surfhunter 29	29.5	150	cabin cruiser	SD	1	8.1L volvo	\$ 158,085	5
Malibu	wakesetter LSV	23	53	bowrider/ski	IB	1	8.1L Indmar	\$ 48,235	1
Maxum	3700 sport yacht	37		sport cruiser	SD	2	6.2 L mpi	\$ 229,663	5
Meridian	411 sedan	46.0	400	yacht	IB	2	8.1L merc	\$ 341,300	5
Monterey	228 sun island	23	57	runabout cuddy	SD	1	5.0 L Merc	\$ 37,062	2
Packard	20 cricket	20	25	performance	IB	1	285 hp crusader	\$ 76,000	6
Reinell	246 BR	25	81	runabout bowrider	SD	1	5.7L volvo	\$ 39,995	3
Rinker	282 captiva cuddy	29	100	runabout cuddy	SD	1	6.2L merc	\$ 52,295	6
Rinker	Fiesta Vee 342	37	235	cruiser	SD	2	5.7L merc	\$ 166,000	5
Rinker	Fiesta Vee 410	43.5	300	cruiser	IB	2	8.1L merc	\$ 339,000	9
Sea Doo	Speedster 200	20	40	jet boat	SD	1	rotax 155 hp	\$ 27,299	2
Sea Ray	180 sport	18	21	runabout bowrider	SD	1	3.0 L Merc	\$ 21,785	7
Sea Ray	185 sport	19	26	runabout bowrider	SD	1	3.0 L Merc	\$ 26,848	7
Sea Ray	200 select	21	37	runabout bowrider	SD	1	4.3 L Merc	\$ 41,325	7
Sea Ray	200 sport	21	37	runabout bowrider	SD	1	4.3 L Merc	\$ 34,461	7
Sea Ray	200 sundeck	21	40	runabout bowrider	SD	1	4.3 L Merc	\$ 42,247	7
Sea Ray	200 select	21	37	runabout bowrider	SD	1	5.0 L Merc	\$ 27,742	2
Sea Ray	200 select	21	37	runabout bowrider	SD	1	5.0 L Merc	\$ 32,209	2
Sea Ray	220 select	23	47	runabout bowrider	SD	1	5.0 L Merc	\$ 51,561	7

Sea Ray	280 sundancer	31	100	sport cruiser	SD	1	8.1 L Merc	\$ 140,193	7
Sea Ray	340 sundancer	38	225	sport cruiser	IB	2	6.2 L Merc	\$ 179,900	6
Sea Ray	340 sundancer	38	225	sport cruiser	IB	2	6.2 L Merc	\$ 243,149	7
Sea Ray	420 sundancer	45	335	sport yacht	SD	2	8.1 L Merc	\$ 575,991	7
Session	Si/Xi	24	38	runabout	SD	1	5.7L merc	\$ 38,995	1
Stingray	180r	18	21	runabout bowrider	SD	1	3.0L	\$ 9,995	1
Tige	switch V	20	38	runabout ski	IB	1	5.0L	\$ 33,831	3
Yamaha	LX 210	21	42.0	jet boat	SD	2	3cyl, 2s 270 hp	\$ 21,499	8
Yamaha	AR 210	21	42.0	jet boat	SD	2	3cyl, 2s 270 hp	\$ 22,999	8
Yamaha	SX 230	23	50.0	runabout/jet boat	SD	2	4cyl, 4s 280 hp	\$ 29,999	8
Yamaha	AR 230	23	50.0	runabout/jet boat	SD	2	4cyl, 4s 280 hp	\$ 31,999	8
Yamaha	SR 230	23	50.0	runabout/jet boat	SD	2	4cyl, 4s 280 hp	\$ 26,999	8

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2. Trailer Boats Magazine, April 2004
3. Trailer Boats Magazine, May 2004
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6. "Boatshow Preview," Motorboating Magazine, 2002, www.motorboating.com
7. www.tradeayacht.com/newboats.html, May 25, 2004
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APPENDIX C1: PRICE DATA FOR OB ENGINES

Manufacturer	HP	cyl	Disp (L)	Weight (lbs.)	Stroke	Fuel System	Base Price
Tohatsu	2.5	1	0.075	28	2-stroke	carbureted	\$ 630
Nissan	2.5	1	0.075	28	2-stroke	carbureted	\$ 664
Mercury	2.5	1	0.075	28	2-stroke	carbureted	\$ 704
Mercury	3.3	1	0.075	29	2-stroke	carbureted	\$ 803
Tohatsu	3.5	1	0.075	28	2-stroke	carbureted	\$ 703
Nissan	3.5	1	0.075	28	2-stroke	carbureted	\$ 739
Bombardier (Johnson)	3.5	1	0.078	30	2-stroke	carbureted	\$ 900
Mercury	4	1	0.102	45	2-stroke	carbureted	\$ 1,067
Mercury	5	1	0.102	45	2-stroke	carbureted	\$ 1,221
Bombardier (Johnson)	6	2	0.164	56	2-stroke	carbureted	\$ 1,619
Mercury	8	2	0.21	73	2-stroke	carbureted	\$ 1,672
Bombardier (Johnson)	8	2	0.164	56	2-stroke	carbureted	\$ 1,788
Yamaha	8	2	0.165	60	2-stroke	carbureted	\$ 1,900
Mercury	9.9	2	0.262	77	2-stroke	carbureted	\$ 2,024
Mercury	9.9	2	0.323	127	2-stroke	carbureted	\$ 2,222
Bombardier (Johnson)	9.9	2	0.255	74	2-stroke	carbureted	\$ 2,250
Yamaha	9.9	2	0.246	79	2-stroke	carbureted	\$ 2,400
Mercury	9.9	2	0.323	133	2-stroke	carbureted	\$ 2,684
Mercury	15	2	0.262	77	2-stroke	carbureted	\$ 2,288
Mercury	15	2	0.323	128	2-stroke	carbureted	\$ 2,519
Yamaha	15	2	0.246	83	2-stroke	carbureted	\$ 2,590
Bombardier (Johnson)	15	2	0.253	74	2-stroke	carbureted	\$ 2,643
Mercury	25	2	0.4	114	2-stroke	carbureted	\$ 2,651
Yamaha	25	2	0.395	106	2-stroke	carbureted	\$ 2,900
Bombardier (Johnson)	25	2	0.521	117	2-stroke	carbureted	\$ 2,981
Mercury	25	2	0.498	178	2-stroke	carbureted	\$ 3,135
Mercury	25	2	0.4	114	2-stroke	carbureted	\$ 3,355
Honda	2	1	0.057	27	4-stroke	carbureted	\$ 880
Yamaha	2.5	1	0.072	37	4-stroke	carbureted	\$ 950
Tohatsu	4	1	0.123	57	4-stroke	carbureted	\$ 1,134
Nissan	4	1	0.123	57	4-stroke	carbureted	\$ 1,156
Suzuki	4	1	0.138	55	4-stroke	carbureted	\$ 1,202
Bombardier (Johnson)	4	1	0.138	55	4-stroke	carbureted	\$ 1,294
Mercury	4	1	0.123	55	4-stroke	carbureted	\$ 1,298
Yamaha	4	1	0.112	49	4-stroke	carbureted	\$ 1,310
Tohatsu	5	1	0.123	55	4-stroke	carbureted	\$ 1,320
Nissan	5	1	0.123	55	4-stroke	carbureted	\$ 1,347
Mercury	5	1	0.123	55	4-stroke	carbureted	\$ 1,507
Honda	5	1	0.127	60	4-stroke	carbureted	\$ 1,700
Tohatsu	6	1	0.123	55	4-stroke	carbureted	\$ 1,413
Nissan	6	1	0.123	55	4-stroke	carbureted	\$ 1,441
Suzuki	6	1	0.138	55	4-stroke	carbureted	\$ 1,576
Mercury	6	1	0.123	55	4-stroke	carbureted	\$ 1,727
Bombardier (Johnson)	6	1	0.128	68	4-stroke	carbureted	\$ 1,919
Yamaha	6	2	0.197	83	4-stroke	carbureted	\$ 2,090
Tohatsu	8	2	0.21	81	4-stroke	carbureted	\$ 1,889
Nissan	8	2	0.21	81.5	4-stroke	carbureted	\$ 1,927
Bombardier (Johnson)	8	2	0.21	83	4-stroke	carbureted	\$ 2,075
Honda	8	2	0.222	77	4-stroke	carbureted	\$ 2,160
Yamaha	8	2	0.197	83	4-stroke	carbureted	\$ 2,220
Honda	8	2	0.222	98	4-stroke	carbureted	\$ 2,530
Yamaha	8	2	0.197	102	4-stroke	carbureted	\$ 2,610

Tohatsu	9.8	2	0.21	81.5	4-stroke	carbureted	\$ 2,043
Nissan	9.8	2	0.21	81.5	4-stroke	carbureted	\$ 2,084
Mercury	9.9	2	0.323	111	4-stroke	carbureted	\$ 2,024
Bombardier (Johnson)	9.9	2	0.302	97	4-stroke	carbureted	\$ 2,294
Yamaha	9.9	2	0.232	91	4-stroke	carbureted	\$ 2,480
Suzuki	9.9	2	0.302	97	4-stroke	carbureted	\$ 2,531
Honda	9.9	2	0.222	87	4-stroke	carbureted	\$ 2,670
Honda	9.9	2	0.222	98	4-stroke	carbureted	\$ 2,830
Yamaha	9.9	2	0.232	99	4-stroke	carbureted	\$ 2,950
Tohatsu	15	2	0.328	113	4-stroke	carbureted	\$ 2,336
Mercury	15	2	0.323	112	4-stroke	carbureted	\$ 2,354
Nissan	15	2	0.328	113	4-stroke	carbureted	\$ 2,383
Bombardier (Johnson)	15	2	0.302	97	4-stroke	carbureted	\$ 2,625
Yamaha	15	2	0.323	99	4-stroke	carbureted	\$ 2,820
Suzuki	15	2	0.302	97	4-stroke	carbureted	\$ 2,841
Honda	15	2	0.35	101	4-stroke	carbureted	\$ 3,140
Honda	15	2	0.35	131	4-stroke	carbureted	\$ 4,010
Tohatsu	18	2	0.328	113	4-stroke	carbureted	\$ 2,576
Nissan	18	2	0.328	113	4-stroke	carbureted	\$ 2,629
Honda	20	2	0.35	103	4-stroke	carbureted	\$ 3,420
Yamaha	25	2	0.498	136	4-stroke	carbureted	\$ 3,340
Yamaha	25	2	0.498	190	4-stroke	carbureted	\$ 4,220
Tohatsu	25	3	0.492	151	4-stroke	carbureted	\$ 3,134
Nissan	25	3	0.492	151	4-stroke	carbureted	\$ 3,199
Suzuki	25	3	0.597	221	4-stroke	carbureted	\$ 3,747
Bombardier (Johnson)	25	3	0.597	212	4-stroke	carbureted	\$ 3,919
Honda	25	3	0.499	128	4-stroke	carbureted	\$ 4,630
Bombardier (Johnson)	30	2	0.521	117	2-stroke	carbureted	\$ 3,244
Bombardier (Johnson)	40	2	0.737	195	2-stroke	carbureted	\$ 3,913
Mercury	40	3	0.966	204	2-stroke	carbureted	\$ 3,366
Yamaha	40	3	0.698	189	2-stroke	carbureted	\$ 4,120
Bombardier (Johnson)	50	2	0.737	202	2-stroke	carbureted	\$ 4,744
Mercury	50	3	0.966	204	2-stroke	carbureted	\$ 4,235
Yamaha	50	3	0.698	189	2-stroke	carbureted	\$ 4,600
Mercury	50	4	0.995	264	2-stroke	carbureted	\$ 6,083
Bombardier (Evinrude)	40	2	0.9	235	2-stroke	DFI	\$ 4,988
Tohatsu	40	3	0.697	210	2-stroke	DFI	\$ 4,770
Nissan	40	3	0.697	210	2-stroke	DFI	\$ 4,871
Bombardier (Evinrude)	50	2	0.9	235	2-stroke	DFI	\$ 6,831
Tohatsu	50	3	0.697	210	2-stroke	DFI	\$ 5,461
Nissan	50	3	0.697	210	2-stroke	DFI	\$ 5,547
Mercury	40	4	0.995	240	2-stroke	EFI	\$ 5,709
Mercury	30	3	0.747	204	4-stroke	carbureted	\$ 2,949
Tohatsu	30	3	0.492	151	4-stroke	carbureted	\$ 3,607
Nissan	30	3	0.492	151	4-stroke	carbureted	\$ 3,681
Suzuki	30	3	0.597	221	4-stroke	carbureted	\$ 4,231
Bombardier (Johnson)	30	3	0.597	212	4-stroke	carbureted	\$ 4,906
Honda	30	3	0.499	138	4-stroke	carbureted	\$ 5,030
Yamaha	30	3	0.747	198	4-stroke	carbureted	\$ 5,290
Mercury	40	3	0.747	204	4-stroke	carbureted	\$ 4,257
Yamaha	40	3	0.747	182	4-stroke	carbureted	\$ 4,800
Yamaha	40	3	0.747	203	4-stroke	carbureted	\$ 5,330
Honda	40	3	0.808	196	4-stroke	carbureted	\$ 5,710

Honda	50	3	0.808	196	4-stroke	carbureted	\$ 7,120
Yamaha	50	4	0.935	233	4-stroke	carbureted	\$ 6,500
Yamaha	50	4	0.935	242	4-stroke	carbureted	\$ 6,670
Mercury	30	3	0.747	216	4-stroke	EFI	\$ 4,213
Mercury	40	3	0.747	216	4-stroke	EFI	\$ 4,620
Mercury	50	4	0.995	248	4-stroke	EFI	\$ 5,940
Suzuki	40	3	0.815	243	4-stroke	MPI	\$ 6,056
Bombardier (Johnson)	40	3	0.818	243	4-stroke	MPI	\$ 6,069
Suzuki	50	3	0.815	243	4-stroke	MPI	\$ 6,788
Bombardier (Johnson)	50	3	0.815	243	4-stroke	MPI	\$ 6,900
Mercury	60	3	0.966	219	2-stroke	carbureted	\$ 4,939
Mercury	60	3	0.966	239	2-stroke	carbureted	\$ 5,104
Yamaha	60	3	0.849	228	2-stroke	carbureted	\$ 5,450
Mercury	60	3	0.966	219	2-stroke	carbureted	\$ 5,951
Yamaha	70	3	0.849	228	2-stroke	carbureted	\$ 6,260
Mercury	75	3	1.4	305	2-stroke	carbureted	\$ 5,676
Mercury	90	3	1.4	305	2-stroke	carbureted	\$ 6,061
Mercury	90	3	1.4	305	2-stroke	carbureted	\$ 6,116
Yamaha	90	3	1.1	261	2-stroke	carbureted	\$ 6,750
Mercury	90	3	1.4	305	2-stroke	carbureted	\$ 7,469
Bombardier (Johnson)	90	V4	1.7	335	2-stroke	carbureted	\$ 6,981
Bombardier (Evinrude)	60	2	0.9	235	2-stroke	DFI	\$ 7,438
Tohatsu	70	3	1.3	315	2-stroke	DFI	\$ 6,810
Nissan	70	3	1.3	315	2-stroke	DFI	\$ 6,949
Mercury	75	3	1.5	360	2-stroke	DFI	\$ 7,150
Bombardier (Evinrude)	75	3	1.3	305	2-stroke	DFI	\$ 8,306
Mercury	90	3	1.5	360	2-stroke	DFI	\$ 7,700
Mercury	90	3	1.5	360	2-stroke	DFI	\$ 7,700
Tohatsu	90	3	1.3	315	2-stroke	DFI	\$ 7,886
Nissan	90	3	1.3	315	2-stroke	DFI	\$ 7,999
Bombardier (Evinrude)	90	3	1.3	305	2-stroke	DFI	\$ 8,950
Bombardier (Evinrude)	100	V4	1.7	369	2-stroke	DFI	\$ 9,350
Mercury	60	4	0.995	264	2-stroke	EFI	\$ 6,644
Yamaha	60	4	0.966	244	4-stroke	carbureted	\$ 7,080
Yamaha	60	4	0.966	255	4-stroke	carbureted	\$ 7,240
Yamaha	60	4	0.966	264	4-stroke	carbureted	\$ 7,620
Mercury	75	4	1.6	386	4-stroke	carbureted	\$ 7,436
Yamaha	75	4	1.6	356	4-stroke	carbureted	\$ 8,050
Honda	75	4	1.6	358	4-stroke	carbureted	\$ 9,105
Mercury	90	4	1.6	386	4-stroke	carbureted	\$ 8,063
Mercury	90	4	1.6	386	4-stroke	carbureted	\$ 8,151
Yamaha	90	4	1.6	356	4-stroke	carbureted	\$ 8,600
Yamaha	90	4	1.6	391	4-stroke	carbureted	\$ 9,270
Honda	90	4	1.6	358	4-stroke	carbureted	\$ 9,825
Mercury	60	4	0.995	248	4-stroke	EFI	\$ 6,468
Suzuki	60	4	1.3	335	4-stroke	MPI	\$ 7,475
Bombardier (Johnson)	60	4	1.3	359	4-stroke	MPI	\$ 7,513
Suzuki	70	4	1.3	335	4-stroke	MPI	\$ 8,113
Bombardier (Johnson)	70	4	1.3	359	4-stroke	MPI	\$ 8,125
Suzuki	90	4	2	416	4-stroke	MPI	\$ 8,963
Bombardier (Johnson)	90	4	2	416	4-stroke	MPI	\$ 9,038
Mercury	115	4	1.8	348	2-stroke	carbureted	\$ 7,150
Mercury	115	4	1.8	348	2-stroke	carbureted	\$ 7,359

Tohatsu	115	4	1.8	361	2-stroke	carbureted	\$ 8,046
Mercury	115	4	1.8	348	2-stroke	carbureted	\$ 8,525
Bombardier (Johnson)	115	V4	1.7	335	2-stroke	carbureted	\$ 8,288
Yamaha	115	V4	1.7	358	2-stroke	carbureted	\$ 8,740
Nissan	120	4	1.8	361	2-stroke	carbureted	\$ 8,470
Mercury	125	4	1.8	348	2-stroke	carbureted	\$ 7,546
Mercury	125	4	1.8	368	2-stroke	carbureted	\$ 7,601
Tohatsu	140	4	1.8	361	2-stroke	carbureted	\$ 8,217
Nissan	140	4	1.8	361	2-stroke	carbureted	\$ 8,647
Mercury	150	V6	2.5	406	2-stroke	carbureted	\$ 8,998
Mercury	150	V6	2.5	406	2-stroke	carbureted	\$ 9,086
Yamaha	150	V6	2.6	426	2-stroke	carbureted	\$10,230
Yamaha	150	V6	2.6	418	2-stroke	carbureted	\$10,230
Bombardier (Johnson)	150	V6	2.6	383	2-stroke	carbureted	\$10,281
Bombardier (Johnson)	175	V6	2.6	383	2-stroke	carbureted	\$11,069
Mercury	115	3	1.5	360	2-stroke	DFI	\$ 8,250
Mercury	115	3	1.5	360	2-stroke	DFI	\$ 8,250
Bombardier (Evinrude)	115	V4	1.7	369	2-stroke	DFI	\$ 9,588
Mercury	135	V6	2.5	431	2-stroke	DFI	\$10,780
Mercury	135	V6	2.5	452	2-stroke	DFI	\$10,890
Bombardier (Evinrude)	135	V6	2.6	419	2-stroke	DFI	\$12,525
Mercury	150	V6	2.5	431	2-stroke	DFI	\$12,485
Mercury	150	V6	2.5	452	2-stroke	DFI	\$12,595
Yamaha	150	V6	2.6	475	2-stroke	DFI	\$13,240
Yamaha	150	V6	2.6	468	2-stroke	DFI	\$13,240
Bombardier (Evinrude)	150	V6	2.6	419	2-stroke	DFI	\$14,188
Bombardier (Evinrude)	150	V6	2.6	419	2-stroke	DFI	\$14,938
Mercury	175	V6	2.5	431	2-stroke	DFI	\$13,343
Mercury	175	V6	2.5	452	2-stroke	DFI	\$13,453
Yamaha	175	V6	2.6	475	2-stroke	DFI	\$14,050
Yamaha	175	V6	2.6	468	2-stroke	DFI	\$14,050
Bombardier (Evinrude)	175	V6	2.6	419	2-stroke	DFI	\$15,163
Mercury	150	V6	2.5	407	2-stroke	EFI	\$10,692
Mercury	150	V6	2.5	425	2-stroke	EFI	\$10,802
Honda	115	4	2.3	458	4-stroke	EFI	\$10,215
Yamaha	115	4	1.7	415	4-stroke	EFI	\$10,600
Honda	130	4	2.3	458	4-stroke	EFI	\$11,280
Honda	135	4	2.4	478	4-stroke	EFI	\$12,335
Yamaha	150	4	2.7	466	4-stroke	EFI	\$12,750
Honda	150	4	2.4	478	4-stroke	EFI	\$13,935
Mercury	115	4	1.7	386	4-stroke	MPI	\$ 8,800
Mercury	115	4	1.7	386	4-stroke	MPI	\$ 8,888
Suzuki	115	4	2	416	4-stroke	MPI	\$ 9,468
Yamaha	115	4	1.7	400	4-stroke	MPI	\$ 9,620
Bombardier (Johnson)	115	4	1.9	416	4-stroke	MPI	\$ 9,756
Suzuki	140	4	2	410	4-stroke	MPI	\$10,415
Bombardier (Johnson)	140	4	2	410	4-stroke	MPI	\$10,938
Mercury	200	V6	2.5	406	2-stroke	carbureted	\$10,659
Mercury	200	V6	2.5	415	2-stroke	carbureted	\$10,780
Mercury	200	V6	3	497	2-stroke	DFI	\$13,959
Mercury	200	V6	3	524	2-stroke	DFI	\$14,069
Yamaha	200	V6	2.6	475	2-stroke	DFI	\$14,840
Yamaha	200	V6	2.6	468	2-stroke	DFI	\$14,840

Bombardier (Evinrude)	200	V6	3.3	526	2-stroke	DFI	\$15,888
Bombardier (Evinrude)	200	V6	3.3	517	2-stroke	DFI	\$16,919
Mercury	225	V6	3	497	2-stroke	DFI	\$14,993
Mercury	225	V6	3	524	2-stroke	DFI	\$15,103
Yamaha	225	V6	3.3	539	2-stroke	DFI	\$16,240
Mercury	225	V6	3	497	2-stroke	DFI	\$16,335
Mercury	225	V6	3	497	2-stroke	DFI	\$16,625
Bombardier (Evinrude)	225	V6	3.3	526	2-stroke	DFI	\$17,419
Bombardier (Evinrude)	225	V6	3.3	517	2-stroke	DFI	\$18,969
Yamaha	250	V6	3.3	543	2-stroke	DFI	\$17,620
Yamaha	250	V6	3.3	539	2-stroke	DFI	\$17,620
Bombardier (Evinrude)	250	V6	3.3	526	2-stroke	DFI	\$19,669
Yamaha	300	V6	3.3	543	2-stroke	DFI	\$18,750
Yamaha	300	V6	3.3	539	2-stroke	DFI	\$18,750
Mercury	200	V6	2.5	437	2-stroke	EFI	\$12,144
Mercury	200	V6	3	479	2-stroke	EFI	\$12,672
Yamaha	200	V6	2.6	453	2-stroke	EFI	\$12,910
Yamaha	200	V6	3.1	509	2-stroke	EFI	\$13,250
Mercury	225	V6	3	479	2-stroke	EFI	\$13,035
Mercury	225	V6	3	493	2-stroke	EFI	\$13,145
Yamaha	225	V6	3.1	509	2-stroke	EFI	\$14,270
Mercury	250	V6	3	479	2-stroke	EFI	\$14,146
Mercury	250	V6	3	479	2-stroke	EFI	\$14,146
Mercury	250	V6	3	479	2-stroke	EFI	\$14,850
Yamaha	250	V6	3.1	509	2-stroke	EFI	\$15,500
Honda	200	V6	3.5	585	4-stroke	EFI	\$16,430
Yamaha	200	V6	3.4	583	4-stroke	EFI	\$17,190
Mercury	225	V6	3	583	4-stroke	EFI	\$16,775
Honda	225	V6	3.5	585	4-stroke	EFI	\$17,680
Yamaha	225	V6	3.4	583	4-stroke	EFI	\$17,830
Suzuki	200	V6	3.6	580	4-stroke	MPI	\$15,562
Bombardier (Johnson)	200	V6	3.6	580	4-stroke	MPI	\$17,375
Suzuki	225	V6	3.6	580	4-stroke	MPI	\$16,750
Bombardier (Johnson)	225	V6	3.6	580	4-stroke	MPI	\$18,075
Suzuki	250	V6	3.6	580	4-stroke	MPI	\$18,293

Source: Trailer Boats Magazine, January 2004, "Marine Power, 2004."

APPENDIX C2: PRICE DATA FOR OB VESSELS

Manufacturer	Boat	length feet	fuel tank gallons	boat type	# of engines	engine description	total price	boat price	engine(s) price	Cite
Baja	230 sportfish TE	25		express fish boat	2	175 hp merc	\$ 55,900	\$ 28,397	\$ 27,503	5
Bennington	205FS	20	26	pontoon	1	max 90 hp	\$ 29,369	\$ 20,525	\$ 8,844	8
Bennington	207FS	20	26	pontoon	1	max 90 hp	\$ 29,627	\$ 20,783	\$ 8,844	8
Bennington	2050RL	20	26	pontoon	1	max 90 hp	\$ 33,841	\$ 24,997	\$ 8,844	8
Bennington	2275RL	22	26	pontoon	1	max 115 hp	\$ 42,538	\$ 33,692	\$ 8,846	8
Boston Whaler	240 outrage	23.8	150	center console	1	225 hp merc	\$ 58,597	\$ 43,987	\$ 14,610	6
Boston Whaler	320 outrage	32.2	300	center console	2	250 hp merc	\$143,742	\$114,981	\$ 28,761	5
Century	2200 CC	22	110	runabout	1	200 hp yamaha	\$ 47,000	\$ 33,040	\$ 13,960	1
Century	2200 CC	22	110	runabout	1	150 hp yamaha	\$ 37,603	\$ 25,868	\$ 11,735	1
Cobia	210 WA	20	90	runabout cuddy	1	150 hp yamaha	\$ 38,044	\$ 26,309	\$ 11,735	2
Cobia	210 WA	20	90	runabout cuddy	1	200 hp yamaha	\$ 45,442	\$ 31,482	\$ 13,960	2
Delta	28 sport fisherman	28		express fish boat	2	225 hp yamaha	\$116,000	\$ 81,930	\$ 34,070	5
Edgewater	205 express	21		sport cruiser	1	150 hp yamaha	\$ 43,622	\$ 31,887	\$ 11,735	5
Edgewater	265 express	27	207	sport fishing	2	225hp merc	\$106,041	\$ 76,821	\$ 29,220	6
Fountain	38 LX	38	325	express fish boat	3	225 hp merc	\$288,457	\$245,502	\$ 42,955	5
Grady-White	tournament 185	18	60	runabout	1	115 hp yamaha	\$ 31,235	\$ 21,582	\$ 9,653	4
Grady-White	258 voyager	25	168	sport fishing	2	150hp yamaha	\$ 84,671	\$ 61,201	\$ 23,470	6
Hurricane	fundeck GS 202 OB	20	52	deckboat	1	150 hp yamaha	\$ 28,950	\$ 17,215	\$ 11,735	4
Mako Marine	192 center console	19	80	center console	1	90 hp merc	\$ 27,190	\$ 20,123	\$ 7,067	3
Mako Marine	192 center console	19	80	center console	1	150 hp honda	\$ 35,075	\$ 21,140	\$ 13,935	3
McKee Craft	freedom 23 tournament	24	180	center console	2	150 hp honda	\$ 72,995	\$ 53,700	\$ 19,295	3
Nitro	640 LX	16.3		bass fishing	1	40 hp (90 max)	\$ 9,995	\$ 6,629	\$ 3,366	7
Nitro	700 LX	17		bass fishing	1	60 hp (125 max)	\$ 11,995	\$ 7,056	\$ 4,939	7
Nitro	175 Sport	17.4		fish N ski	1	60 hp (125 max)	\$ 13,995	\$ 9,056	\$ 4,939	7
Nitro	NX 750	17.5		bass fishing	1	60 hp (135 max)	\$ 13,795	\$ 8,856	\$ 4,939	7
Nitro	185 Sport	18		fish N ski	1	75 hp (150 max)	\$ 16,795	\$ 11,119	\$ 5,676	7
Nitro	NX 882	18.2		bass fishing	1	75 hp (175 max)	\$ 18,595	\$ 12,919	\$ 5,676	7
Nitro	901 CDX	19.2		bass fishing	1	90 hp (200 max)	\$ 26,500	\$ 20,439	\$ 6,061	7
Nitro	205 Sport	20		fish N ski	1	115 hp (225 max)	\$ 19,995	\$ 12,845	\$ 7,150	7
Nitro	929 CDX	20.9		bass fishing	1	200 hp (300 max)	\$ 29,500	\$ 18,841	\$ 10,659	7
Pelican	8E Ram X	8		pontoon/fishing	1	<25 hp	\$ 2,715	\$ 460	\$ 2,250	7
Pelican	Gecko 8E Ram X	8		pontoon/fishing	1	<25 hp	\$ 2,825	\$ 570	\$ 2,250	7
Pelican	Classic 8	8		pontoon/fishing	1	<25 hp	\$ 2,735	\$ 480	\$ 2,250	7
Pelican	Bass Raider 8 Ram X	8		pontoon/fishing	1	<25 hp	\$ 2,695	\$ 440	\$ 2,250	7

Pelican	Classic 10	10		pontoon/fishing	1	<25 hp	\$ 2,885	\$ 630	\$ 2,250	7
Pelican	Bass Raider 10 Ram X	10		pontoon/fishing	1	<25 hp	\$ 2,735	\$ 480	\$ 2,250	7
Pelican	Bass Raider 10E	10		pontoon/fishing	1	<25 hp	\$ 2,785	\$ 530	\$ 2,250	7
Pelican	10 Ram X	10		pontoon/fishing	1	<25 hp	\$ 3,035	\$ 780	\$ 2,250	7
Pelican	Intruder	12		deck/fishing	1	<25 hp	\$ 2,705	\$ 450	\$ 2,250	7
Polar	2100 CC	21	97	fishing	1	150 hp yamaha	\$ 28,529	\$ 16,794	\$ 11,735	1
Polar	2100 CC	21	97	fishing	1	150 hp yamaha	\$ 34,965	\$ 23,230	\$ 11,735	1
Pro Sports	2860 KAT SC	29	238	center console	2	140 hp suzuki	\$ 68,215	\$ 53,700	\$ 20,830	3
Pro Sports	2860 KAT SC	29	238	center console	2	250 hp suzuki	\$ 91,367	\$ 53,700	\$ 36,586	3
Pursuit	3370 offshore	35.1	310	express fish boat	2	225 hp yamaha	\$206,065	\$175,555	\$ 30,510	5
Quintrex	168 coast runner	16.7	26	runabout	1	60 hp yamaha	\$ 16,190	\$ 9,110	\$ 7,080	1
Sanpan	2500 delux cruiser	25	24	pontoon	1	115 yamaha	\$ 29,300	\$ 19,647	\$ 9,653	4
Tracker	Grizzly 1448	14		utility	1	4 hp (40 max)	\$ 1,529	\$ 462	\$ 1,067	7
Tracker	Grizzly 1436	14		utility	1	2.5 hp (20 max)	\$ 1,159	\$ 455	\$ 704	7
Tracker	Super Guide V14	14.1		bass fishing	1	15 hp (40 max)	\$ 4,695	\$ 2,407	\$ 2,288	7
Tracker	Super Guide V15	15.2		bass fishing	1	25 hp (60 max)	\$ 5,495	\$ 2,844	\$ 2,651	7
Tracker	Grizzly 1542	15.3		utility	1	4 hp (40 max)	\$ 1,499	\$ 432	\$ 1,067	7
Tracker	Panfish 16	15.8		bass fishing	1	15 hp (40 max)	\$ 5,995	\$ 3,707	\$ 2,288	7
Tracker	Pro Team 165	15.9		bass fishing	1	25 hp (50 max)	\$ 6,395	\$ 3,744	\$ 2,651	7
Tracker	Suber Guide V16	16.1		bass fishing	1	25 hp (60 max)	\$ 6,195	\$ 3,544	\$ 2,651	7
Tracker	Pro Angler V16	16.1		bass fishing	1	40 hp (75 max)	\$ 7,795	\$ 4,429	\$ 3,366	7
Tracker	Grizzly 1648	16.2		utility	1	4 hp (50 max)	\$ 1,699	\$ 632	\$ 1,067	7
Tracker	Grizzly Bass T	16.2		bass fishing	1	15 hp (40 max)	\$ 5,395	\$ 3,107	\$ 2,288	7
Tracker	Deep V16 Combo	16.4		bass fishing	1	40 hp (75 max)	\$ 9,995	\$ 6,629	\$ 3,366	7
Tracker	Pro Deep V16	16.5		bass fishing	1	40 hp (75 max)	\$ 9,295	\$ 5,929	\$ 3,366	7
Tracker	Targa 17 Combo	16.9		bass fishing	1	60 hp (125 max)	\$ 12,995	\$ 8,056	\$ 4,939	7
Tracker	Targa 17 DVR	16.9		bass fishing	1	60 hp (135 max)	\$ 9,995	\$ 5,056	\$ 4,939	7
Tracker	Pro Crappie 175	17.2		bass fishing	1	40 hp (75 max)	\$ 6,995	\$ 3,629	\$ 3,366	7
Tracker	Pro Team 175	17.2		bass fishing	1	40 hp (75 max)	\$ 7,395	\$ 4,029	\$ 3,366	7
Tracker	Targa 17	17.4		bass fishing	1	75 hp (150 max)	\$ 12,995	\$ 7,319	\$ 5,676	7
Tracker	Pro Deep V 17	17.5		bass fishing	1	40 hp (90 max)	\$ 10,695	\$ 7,329	\$ 3,366	7
Tracker	Pro Team 18 Jet	18		bass fishing	1	50 hp (120 max)	\$ 10,995	\$ 6,760	\$ 4,235	7
Tracker	Grizzly 1848	18.1		utility	1	4 hp (40 max)	\$ 1,999	\$ 932	\$ 1,067	7
Tracker	Pro Team 185 Jet	18.2		bass fishing	1	75 hp (175 max)	\$ 13,495	\$ 7,819	\$ 5,676	7
Tracker	Pro Team 185	18.2		bass fishing	1	40 hp (90 max)	\$ 9,895	\$ 6,529	\$ 3,366	7
Tracker	Tournament V18	18.2		bass fishing	1	75 hp (150 max)	\$ 13,495	\$ 7,819	\$ 5,676	7
Tracker	Grizzly 1860	18.3		utility	1	6 hp (80 max)	\$ 2,549	\$ 822	\$ 1,727	7
Tracker	Targa 1900	18.5		bass fishing	1	90 hp (200 max)	\$ 20,995	\$ 14,934	\$ 6,061	7

Tracker	Targa 18	18.5		bass fishing	1	75 hp (175 max)	\$ 14,995	\$ 9,319	\$ 5,676	7
Tracker	Targa 19 SE	19.8		bass fishing	1	75 hp (150 max)	\$ 16,495	\$ 10,819	\$ 5,676	7
Tracker	Targa 2000	20		bass fishing	1	115 hp (225 max)	\$ 25,295	\$ 18,145	\$ 7,150	7
Triton	2690 center console	25	204	center console	2	150hp honda	\$ 70,706	\$ 46,965	\$ 23,741	4
Triumph	191 walkthrough	18.5	45	runabout bowrider	1	115 hp merc	\$ 23,756	\$ 15,213	\$ 8,543	4
Triumph	191 walkthrough	18.5	45	runabout bowrider	1	150 hp merc	\$ 25,550	\$ 14,774	\$ 10,776	4
Trophy	2305 tournament edition	25	163	center council	2	200 hp merc	\$ 75,495	\$ 50,734	\$ 24,761	4
Trophy	2305 tournament edition	25	163	center council	2	250 hp merc	\$ 99,995	\$ 71,234	\$ 28,761	4

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7. www.epinions.com, June 29, 2004
8. www.tradeayacht.com/newboats.html, May 25, 2004

APPENDIX C3: E-MAIL FROM NMMA FACTS AND FIGURES

James Petru <jpetru@nmma.org>

Received Date: 07/07/04 11:31:59 AM
Transmission Date: 07/07/04 11:31:59 AM

To: Michael Samulski/AA/USEPA/US@EPA
cc: Vicky Yu <VYu@nmma.org>
Subject: RE: You have a new question from the NMMA website!

Michael

There are probably several factors which may explain this, first the average life of an outboard boat is about 25 years while the average life of an outboard engine is 20 years. Secondly you have to factor in the a number of outboard boats have twin engines and while we do not have any hard data on this, if you look at the growth of the center consol boat group which tends to have twin outboards you end up getting more engines sold than boats.

Since sterndrive and inboard engines are an integral part of the boat we do not track them the same way.

Jim Petru
Director of Market Statistics
NMMA
312 946-6202

-----Original Message-----

From: samulski.michael@epa.gov [mailto:samulski.michael@epa.gov]
Sent: Wednesday, July 07, 2004 8:11 AM
To: Vicky Yu
Subject: You have a new question from the NMMA website!

The following person visited the Contact Us page of the NMMA website and wanted to contact you.

Please try to answer this email to the visitor as soon as possible. Here is the person's information:

First Name: Mike
Last Name: Samulski
Email: samulski.michael@epa.gov

Company: U.S. EPA

Address:
2000 Traverwood Drive
City: Ann Arbor
State: MI
Zip Code: 48105
Country: USA

Message:

I have found your facts and figures data to be very useful in getting an understanding of the boating industry. However, there is one thing that seems inconsistent to me that I have not been able to resolve on my own.

The ratio of outboard engine population to outboard boat population is much different than the ratio of outboard engine sales to outboard boat sales. For example for 2003:

OB pop/OB boat Pop = $8,381,100/8,976,500 = 1.07$

OB sales/OB boat sales = $302,100/212,000 = 1.43$

My question is what is the reason for this difference?

Is this a result of boats living much longer than engines, a change in the market, or a difference in the way boat sales vs. population are determined? If it is a difference in life, is it mostly for a certain sized engine (i.e. trolling)? Also, does this relationship occur for sterndrive and inboard marine engines?

Thank you in advance for your response.

Mike Samulski
734 214 4532